AD-A103 621 ARIZONA UNIV TUCSON F/G 7/2
ENERGY-LEVEL AND GROTRIAN DIAGRAMS FOR MANGANESE.(U)
AUG 81 S BASHKIN N00014-80-C-0839
UNCLASSIFIED NL

CONT

Final rept. 1 Jul 80 — 30 June 81

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER

2. GOVT ACCESSION NO. AD-A103621

3. RECIPIENT'S CATALOG NUMBER

4. TITLE *(and Subtitle)*
Energy-Level and Grotrian Diagrams for Manganese.

5. TYPE OF REPORT & PERIOD COVERED
Final: July 1, 1980 - June 30, 1981

6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)
Stanley Bashkin

8. CONTRACT OR GRANT NUMBER(s)
N00014-80-C-0839

9. PERFORMING ORGANIZATION NAME AND ADDRESS
University of Arizona
Tucson, AZ 85721

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS

11. CONTROLLING OFFICE NAME AND ADDRESS
Office of Naval Research
Arlington, VA 22217

12. REPORT DATE
August 25, 1981

13. NUMBER OF PAGES
two

14. MONITORING AGENCY NAME & ADDRESS *(if different from Controlling Office)*

15. SECURITY CLASS. *(of this report)*
unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*
Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

DTIC ELECTE SEP 2 1981 D H

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*
Spectroscopy

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*
Energy-level and Grotrian diagrams were completed for all stages of ionization of manganese.

81 8 31 195

DD FORM 1 JAN 73 1473

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

AD A103621

DTIC FILE COPY

Ref: 650:gs
N00014-80-C-0839

FINAL TECHNICAL REPORT

Abstract

Energy-level and Grotrian diagrams were completed for all stages of ionization of manganese.

Funds were provided under this grant to permit completion of the energy-level and Grotrian diagrams for the element manganese in all stages of ionization. Such drawings were to extend the series of volumes dealing with the pictorial representations of data gathered from atomic spectroscopy. Previous work along this line led to the publication of two volumes and an addendum volume; a third volume is now in the final stages of publication.

It is a pleasure to report that the manganese project has now been finished. All the drawings have been inked and corrected. The text which is to accompany the drawings is currently being prepared; all systems through Mn VII have been described and the relevant references summarized. In addition, certain mechanical work having to do with the clarity of representation of the data is in progress.

We expect that the work on manganese will be submitted to the publisher later this calendar year. Once the proofs of the text have been reviewed by us, the drawings will be ready for publication, which we expect will occur early in 1982.

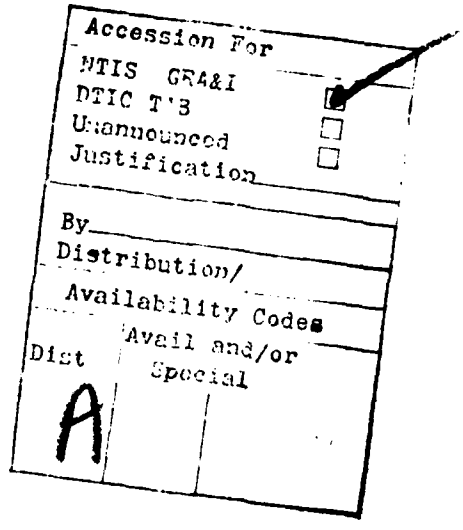
All the funds provided by ONR were consumed, so that it is not possible for us to continue our work to higher elements in the periodic table. However, it is perhaps worth mentioning that the most important element from the standpoint of spectroscopy is iron, which directly follows manganese, and we have already done a considerable amount of work towards publication of a book on that element. Were additional money be made available, we could finish our series with an especially significant contribution to physics, astrophysics and chemistry.

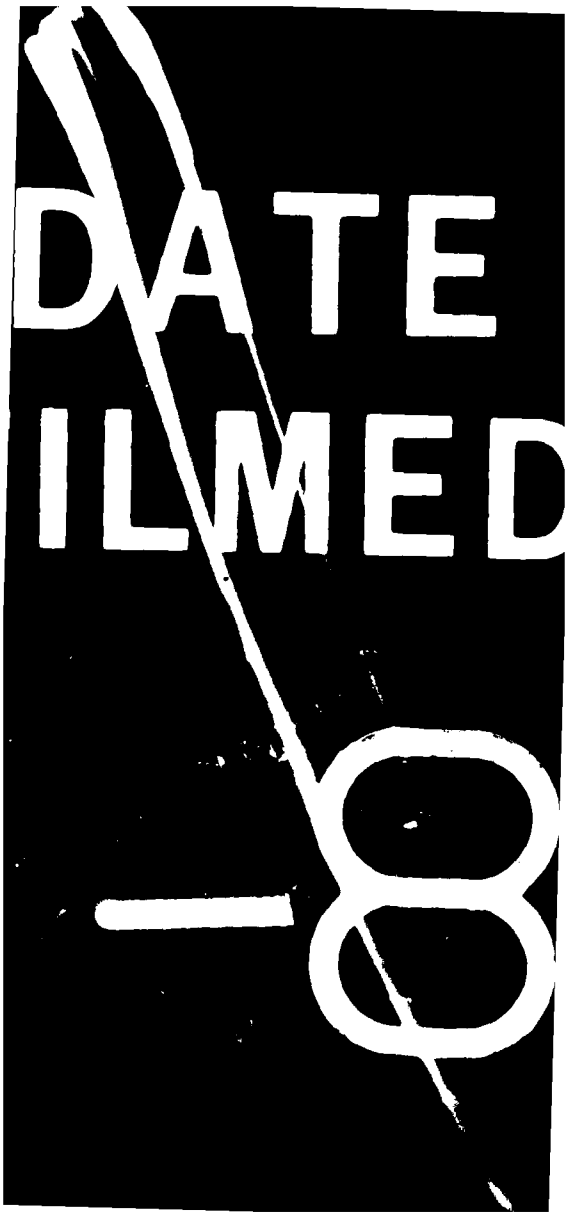
We express our gratitude to ONR for the invaluable help in the completion of the work on manganese.

Respectfully submitted,

Stanley Bashkin
Principal Investigator

ale




DATE
ILMED
8

AD-A103 621 ARIZONA UNIV TUCSON F/G 7/2
ENERGY-LEVEL AND GROTRIAN DIAGRAMS FOR MANGANESE.(U)
AUG 81 S BASHKIN N00014-80-C-0839
UNCLASSIFIED NL

SUPPLEMENTARY

INFORMATION

Corrected copy

AD-A103 621

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* ENERGY-LEVEL AND GROTRIAN DIAGRAMS FOR MANGANESE.		5. TYPE OF REPORT & PERIOD COVERED Final: July 1, 1980-June 30, 1981 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Stanley Bashkin		8. CONTRACT OR GRANT NUMBER(s) N00014 - 80 - C - 0839
9. PERFORMING ORGANIZATION NAME AND ADDRESS University of Arizona Tucson, Arizona 85721		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Arlington, Va 22217		12. REPORT DATE December 1, 1981 13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS*(if different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Spectroscopy; atomic structure; energy-level diagrams; Grotrian diagrams.

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This contract resulted in completion of the atomic energy-level and Grotrian diagrams for all stages of the element, manganese. These drawings will be published by North-Holland Publishing Co. as Vol. 4 of a series of which this is to be the last. Publication of the volume is expected during calendar year 1982.

DD FORM 1 JAN 73 1473

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

Abstract: This contract resulted in completion of the atomic energy-level and Grotrian diagrams for all stages of the element, manganese. These drawings will be published by North-Holland Publishing Co. as Vol. 4 of a series of which this is to be the last. Publication of the volume is expected during calendar year 1982.

For somewhat over ten years, we have been engaged in the preparation of energy-level and Grotrian diagrams for all stages of ionization of the chemical elements. It was our original intention to publish such compilations, based on the world assembly of information, for all elements. Prior to the present stage, such diagrams were prepared for all elements from hydrogen through chromium, and were published in three volumes plus one addendum volume, the publisher being North-Holland Publishing Co.

Towards the end of the work on chromium, it became clear that we would be unable, because of severe financial strictures, to continue the series to the higher elements. However, a great deal of work had already been done on manganese, and it seemed most desirable to complete that project. It was to this end that the ONR contract was negotiated. It is a pleasure to report that the project was completed as promised.

As of this writing, the bibliographical material for the 25 stages of ionization is being prepared. Indeed, 12 stages have been finished. Some mechanical work must also be done on some of the drawings, and that is in progress. We expect that the text will be finished this calendar year, and the final touches put on the drawings early in 1982. Thus we look forward to the appearance of the publication of these drawings in 1982.

This publication, which will be Vol. 4 in the series, will also be the last, since no more money is available to continue the project. We feel constrained to remark that it is unfortunate that we were not permitted to continue the series through the next element, iron, since iron is the most important element of all from the standpoint of spectroscopy, and we have already done considerable work on the drawings for it. Should it become financially possible to support this project again, we would be prepared to resume the production of these important drawings.


DA
FILM